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two to three inches beneath the surface. Jack rabbits inhabited the areas in great numbers and it was first observed that wherever alkaline waters had come in contact with their feces the water, which usually held in small puddles, took on a dark brown color not unlike that of the waters holding in many unclean barnyards after a rainstorm. The decomposition of the fecal matter appeared to be comparatively rapid when in contact with the alkaline waters or with the moist alkali soil and air. The animal refuse was observed in all stages of decomposition from the fresh droppings to the complete disappearance of the original organic material. With the evaporation of the waters which had been in contact with this refuse the soil took on the brown color noted and responded to tests for nitrates. Fecal matter from cattle and horses was later observed undergoing the same type of decomposition and producing similar brown spots containing nitrates. All of the water on the playas examined was of an alkaline nature.

Since these observations are in harmony with the established principles of niter formation in India there was no hesitation in concluding that the brown "niter spots" of the playas were, as far as examined, of animal origin.

From these Nevada observations it is safe to predict that in fields of the arid western states brown "niter spots" will appear when live stock is pastured in the same and alkaline waters are used for irrigation. In this connection it would be important to know if live stock was pastured in the fields in which Stewart and Peterson made their observations. This fact would seemingly have an important bearing on their conclusions.

WALTER STALDER

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SCIENTIFIC BOOKS

Historical Introduction to Mathematical Literature. By G. A. MILLER, Professor of Mathematics in the University of Illinois. New York, The Macmillan Co., 1916. Pp. xiii + 302.

This valuable work is decidedly unique. It

is not a history of mathematics, yet contains much accurate historical information. It is not a bibliography of mathematics, yet it says much about books, journals and dictionaries. It is not a volume on mathematical recreations, yet is most interesting reading. It is not a philosophy of mathematics, though it illumines such matters as Bertrand Russell's definition of mathematics as "the subject in which we never know what we are talking about nor whether what we are saying is true." It is not a collection of biographies, though brief sketches of twenty-five leading mathematicians are given in one of the chapters. The book gives much miscellaneous information on recent mathematical activity in different countries of the world. The organization of mathematical societies, the starting of mathematical journals, the trend of modern thought along the lines of arithmetic, algebra, geometry and analysis, are all presented in a popular and pleasing manner, by one who is able to take a broad view of the mathematics of to-day. Attention is given to topics of general interest, such as Fermat's last theorem, magic squares, systems of numeral notation, women mathematicians, the international commission on the teaching of mathematics. The purposes of the book, as expressed in the words of the author, are "to meet the needs of a text-book for synoptic and inspirational courses which can be followed successfully by those who have not had extensive mathematical training. It may also be used as a text-book for a first course in the history of mathematics, especially by those teachers who believe with its author that such a first course should largely concern itself with recent mathematical events and developments." This aim is achieved in an eminently satisfactory manner. The book meets a real want.

The list of books on the history and the teaching of mathematics, recommended by the author, is selected more particularly to meet the needs of English readers. This list makes it painfully conspicuous that there are at present no up-to-date general histories of mathematics in the English language. The best general histories are in the German language. In

recent years much criticism has been passed upon Moritz Cantor's monumental work, written in German, yet nothing approaching it exists in the English language. Cantor is now in his eighty-seventh year and is nearly blind. If the revisions of his volumes which were planned before the war, and were to be executed by younger men, are carried out, then his history will doubtless maintain an undisputed supremacy for many years to come. Professor Miller says that Tropfke's work is "getting too old to be entirely reliable." Tropfke himself stated last spring to the present writer that his history needed revision. But Miller's criticism on Tropfke's history applies with even greater force to the general histories written in the English language.

FLORIAN CAJORI

COLORADO COLLEGE,
COLORADO SPRINGS, COLO.

Dyestuffs and Coal Tar Products. Their Chemistry, Manufacture and Application. By THOMAS BEACALL, B.A., F. CHALLENGER, Ph.D., B.Sc., GEOFFREY MARTIN, Ph.D., M.Sc., B.Sc., and HENRY J. S. SAND, D.Sc., Ph.D. Pub. D. Appleton and Co. 8vo. 156 pages, 29 fig.

The critical situation which developed in the textile, leather and other industries on account of the shortage of dyes, as well as in the pharmaceutical and photographic trades on account of a similar shortage of synthetic drugs and organic chemicals was largely responsible for the publication of this book. It is virtually a reprint with certain revisions and additions of chapters from "Industrial and Manufacturing Chemistry," Vol. 1, edited by Geoffrey Martin, on the following subjects:

"Industry of Coal Tar and Coal Tar Products."
"Industry of the Synthetic Coloring Matters."
"Industry of Natural Dyestuffs."
"The Dyeing and Color-Printing Industry."
"Modern Inks."
"Saccharine and other Sweetening Chemicals."
"The Industry of Modern Synthetic Drugs."
"The Industry of Photographic Chemicals."

The field covered is so broad and presents such extreme possibilities of theoretical and

practical details that the present publication can only be looked upon as a résumé. To those having a knowledge of organic chemistry a study of the book will serve as a valuable review and a foundation for further study. A valuable feature of the book is the bibliography at the introduction of each chapter.

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PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

THE third number of volume 2 of the *Proceedings of the National Academy of Sciences* contains the following articles:

1. *The Mechanics of Intrusion of the Black Hills (S. D.) Pre-Cambrian Granite*: SIDNEY PAIGE, U. S. Geological Survey, Washington, D. C.
2. *On the Fossil Algae of the Petroleum-Yielding Shales of the Green River Formation of Colorado and Utah*: CHARLES A. DAVIS, Bureau of Mines, Washington, D. C.
Scientific, as well as economic interest has been aroused in these shales, because they have recently been discovered to yield petroleum when subjected to destructive distillation in closed retorts. The author finds that these shales may be examined microscopically by the methods of sectioning already in use for peats and coals.
3. *Archeological Explorations at Pecos, New Mexico*: A. V. KIDDER, Department of Archaeology, Phillips Andover Academy.
The most important results are stratigraphical; various styles of pottery being found in superposition.
4. *Man and Metals*: WALTER HOUGH, U. S. National Museum, Washington, D. C.
An account is given of the author's study of the uses of fire by man in so far as the development of metallurgy is concerned.
5. *On the Observed Rotations of a Planetary Nebula*: W. W. CAMPBELL and J. H. MOORE, Lick Observatory, University of California.
The nebula No. 7009 of Dreyer's New General Catalogue is rotating about an axis